



National Park Service - Southwest Alaska Network
Inventory & Monitoring Program

Draft Summary
Fauna Monitoring Scoping Workshop
Vital Signs Monitoring Program
Southwest Alaska Network (SWAN)
17 April, 2003

Compiled by:

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Background

The Southwest Alaska Network (SWAN) held a fauna monitoring scoping workshop on April 17, 2003 at the BLM-Campbell Creek Science Center, Anchorage. This was the fifth in a series of workshops held since August 2002. The purpose of the workshop was to bring together National Park Service staff and invited experts to discuss ideas and options for monitoring fauna as part of an ecologically-based, integrated long-term monitoring program for SWAN park units. Before the workshop, participants were furnished with a workshop notebook that contained background information on the network parks, draft conceptual models, maps, and objectives of the workshop.

This workshop focused on terrestrial fauna. Marine mammals, seabirds, and intertidal invertebrates were discussed during a coastal workshop held in August 2002. Overlapping discussions occurred for species such as Kittlitz Murrelets and Harlequin Ducks that alternately spend different portions of their life cycle in terrestrial and marine environments.

Fourteen participants attended the workshop including members of the SWAN Technical Committee, National Park Service (NPS) staff from the Alaska Support Office, and guest scientists from universities and other federal agencies (attendee's list attached). A flora scoping workshop was held the day before (April 16) and many of the same participants attended both workshops. The fauna workshop was facilitated by Frankie Barker, Tundra Strategies, Chickaloon, AK.

This summary is a compilation of workshop discussions that we reconstructed from flip chart notes, personal notes, and written comments from workshop participants. Any omissions or misinterpretations of statements made by participants is unintentional. In large measure, the summary is meaningful only in the context of information contained in the fauna workshop notebook that was distributed to participants before the workshop. We urge readers to refer back to those notebooks when reviewing this summary.

<http://www1.nature.nps.gov/im/units/nw01/Documents/Workshops/FaunaNotebook.pdf>.

Workshop Objectives

- Session 1. Identify and discuss drivers of change and resource protection issues
- Session 2. Identify candidate fauna for monitoring
- Session 3. Identify potential attributes to monitor for candidate fauna

Prior to the discussion sessions, three presentations were given to provide participants with additional background and context. Network Coordinator Alan

Bennett gave an overview of the networks goals for long-term monitoring, reviewed earlier workshops, and identified the networks expectations from this fauna scoping meeting. Kenai Fjords wildlife biologist Ian Martin gave an introduction to the Network Parks, highlighted key fauna resources, interactions, and fauna-habitat relationships. USGS-Alaska Science Center Biologist Karen Oakely discussed conceptual ecosystem models and the role they can play in depicting ecological relationships and guiding the selection of fauna to monitor.

Session 1: Drivers of Change

Drivers of Change are mechanisms defined as natural processes and events, or human activities. During this session workshop participants identified and discussed drivers of change and addressed the question: What are the most important resource protection issues and scientific issues, or manifestations of those issues, that we need to consider in selecting fauna to monitor - And Why? After listing agents of change each workshop participant was given the opportunity to select two agents they felt were most significant. The combined weighted scores were used to order the list.

Drivers of Change (In order of importance)

Climate
Species Interactions
Human Harvest and Recreational Use
Disease
Land Development
Air Pollution
Exotic Species
Marine Pollution – toxins
Glaciers
Prey Base Changes
Predator Control
Noise

Issues Associated with Drivers of Change

[Workshop participants discussed the 3 highest ranked drivers of change and identified manifestations of greatest concern in influencing animals and habitat]

Climate

- Snow and temperature (duration of ice cover)
- Pacific decadal oscillation– El Nino
- Precipitation – timing and amount
- Warming – temperature changes

Species Interactions

- Predation and competition (for example lynx/hare)

- Changes in vegetation composition
- Changes in salmon abundance, distribution or run timing
- Major range shifts
- Habitat
- Exotic species introductions
- Disease
- Secondary Forces – Proximal factors more closely tied rather than ultimate factors (global driving force)

Human Use (including sport harvest, subsistence harvest, and general recreation)

- Depletion of local populations
- Displacement
- Campsites
- Access
- Habituation
- Habitat loss and fragmentation
- Interference with natural processes
- Pollution

Session 2: Candidate Fauna to Monitor

During this session participants identified candidate species or groups of species that they felt were important to monitor based on the overall network goals for monitoring. For each entry, participants were asked to consider the questions:

- a) Why is this species or group of species important ecologically or socially?
- b) What will changes in this item tell us about overall ecological change?

1. River Otter

- Prey on pelagic fish
- Densities show trends in climate
- Marine–terrestrial nutrient transfer

2. Black Bear

- Driving force in wetlands
- Vegetation salmonberry dispersal
- Transferring marine nutrients to terrestrial
- Management problems
- Habitat generalist

3. Brown bear

- Integrate many ecosystem effects
- Landscape species – require large areas relatively free from human disturbance

- Management issues
- Baseline in protected areas re:hunting
- Coastal populations dependent on sensitive communities (clam beds salt marsh)
- Subsistence – traditional knowledge
- Well studied and high profile species with many opportunities for cooperative monitoring

4. Beaver

- Create and modify habitat for other plants and animals and influences vegetation succession patterns
- Harvested species
- Could monitored at multiple spatial scales
- Alternate prey species for wolves

5. Terrestrial Vertebrate Consumers of Salmon, especially bears, otters, and eagles

- Respond to or control transfer of nutrients from ocean to land
- Keystone ecological interaction in the SWAN
- Transfer toxins among habitats
- Influenced by glacial recession and climate change

6. Caribou

- Relationships between snow depth, lichen availability + winter distribution known
- Movements/distribution responsive to changes in habitat
- Major prey base for large carnivores

7. Wolf/lynx/wolverine/marten and prey base

- Sensitive to human activities
- Wilderness indicators
- Signal changes in habitat

8. Montane raptors and prey base

- Sensitive to toxins/pollution from afar
- Indicator of food web health

9. Lake/riverine/wetland-associated waterfowl, shorebirds and other waterbirds

- Sensitive to habitat change over many spatial scales
- Will respond to exotics or introduced species
- Visible and relatively easy to count over large areas
- Abundance and reproductive success influenced by habitat

10. Kittlitz Murrelet

- Respond to changes in abundance of forage fish
- Colonization and distribution controlled by glacial retreats
- Species of special concern
- Protocols in place for surveys

11. Wood Frogs

- Indicator of climate changes
- Sensitive to toxins
- Relatively inexpensive to survey
- Indicator of habitat change
- Interactions with fish

12. Insect Pollinators

Influence berry production
Flora distribution

13. Earthworms (Soil invertebrates)

- Have profound effects on rate of soil development
- Indicators of naturally functioning ecosystems (gardens)
- Respond to climate change
- Displacement other species

Session 3: Attributes to Monitor

In this session participants were tasked with answering the question: “What are the most informative attributes to monitor for candidate fauna given that the measurements must be relatively simple, inexpensive and sustainable?”

Participants were given an hour to collect their thoughts, discuss ideas, and list attributes to monitor for each of the 13 categories identified during session 2. Notes were recorded on posters hung around the perimeter of the meeting room. When participants reconvened they reviewed the selections, in some cases clarifying or modifying the list.

1. River Otters

- Stable isotope flux in vegetation
- Number of latrine sites/unit coastline
- Otter population density
- Vegetation diversity at latrine sites – check moss species and forbs

2. Black Bears

- Presence/absence
- Abundance index at selected locations (spring counts)

3. Brown Bears

- Abundance
- Age-sex class composition at concentration sites (current inventory of sites needed)
- Harvest and DLP records
- Bear-human interaction records; Records of human bear incidents
- Monitor human use at important bear feeding sites

4. Beavers

- Location and number of active colonies (fall food cache survey)
- Extent/number of active dams/ponds
- Harvest level (sealing records)

5. Terrestrial Vertebrate Consumers of Salmon, especially bears, otters, and eagles

- Bald Eagle breeding distribution and productivity
- Stable isotope ratio in selected drainage's
- Black and brown bear occurrence/distribution on anadromous streams (suggested use of hair snares and photostations)
- Aquatic macroinvertebrate diversity
- Sockeye salmon alevin, parr, or juvenile growth rates
- River otter numbers/productivity

6. Caribou

- Seasonal patterns of distribution. Traditional Ecological Knowledge (TEK) suggested as a tool to evaluate large scale change in caribou use of landscape
- Morphometric and demographic characteristics such as bodyweight and calf survival. Continuation of cooperative work with Alaska Dept of Fish and Game and Becharof National Wildlife Refuge
- Migration and habitat utilization patterns relative to long-term shifts in lichens and other vegetation communities

7. Wolf/lynx/wolverine/marten and prey base

- Presence/absence
- Abundance/distribution
- Harvest statistics
- Prey abundance (snowshoe hare, ptarmigan)

8. Montane raptors and prey base

- Nest locations and breeding productivity
- Index of abundance for small mammals (burrow counts)
- Opportunistic tissue sampling

9. Lake/riverine/wetland-associated waterfowl, shorebirds and other waterbirds

- Trumpeter Swan breeding distribution and reproductive success (continue to participate in USFWS – statewide survey)
- Harlequin duck breeding distribution and reproductive success at selected sites (aerial stream surveys)

Note: Participants acknowledged that they did not have sufficient information concerning waterfowl occurrence to complete this list.

10. Kittlitz Murrelets

Murrelet occurrence (dawn surveys and shorezone counts)

Note: During the coastal nearshore scoping workshop participants identified Black Oystercatchers, Common Murre, Mew Gull, Blacklegged Kittiwake, and Pigeon Gull as candidates for monitoring.

11. Wood Frogs

- Presence/absence (auditory index count or egg mass count)

12. Insect Pollinators

Attributes not identified and participants indicated the need to contact subject area experts for this issue

13. Earthworms (Soil invertebrates)

- Presence/absence (anecdotal shovel samples in conjunction with other monitoring)

Closing Remarks by Invited Guests**Terry Debruyn:**

- Monitoring must go beyond traditional short-term efforts, one-time surveys and develop knowledge concerning the “status” of resources.
- Need to recognize what the threats are to parks, how they will affect animals, and pay special attention to rare species or those most sensitive to threats.
- This program lets us get to long term studies – coordinate with NRAC project process.

David Duffy:

- Unique opportunity to make observations about pristine and intact systems, (as opposed to degraded systems elsewhere in the world) - however this carries a bigger obligation because people will look to us for understanding
- Continuity and longevity more important than perfection
- Be Tom Sawyer - get someone else to do it
- Publish – avoid data narcosis

- Pay attention to the “rhythm of the forest” – natural systems monitoring should strive to understand rhythm (TEK: re salmon, caribou come at certain times.)
- Need exists to monitor active processes

Karen Oakley:

- SWAN provides a great opportunity to track changes in range distribution due its position at intersection of major ecosystems
- Focus on systems that define this network – coastal and aquatic – and avoid the temptation to study everything

Robert Gill:

- Additional inventories are needed before effective monitoring can be accomplished
- Land bird and shorebird regional and national monitoring programs exist that already incorporate network parks
- Direct anthropogenic effects on birds in Alaska are not currently having population level affects.
- Because you have limited resources, ask focused questions (commented that monitoring the relationship between cycles of salmon abundance and population dynamics of salmon consumers may fall beyond scope of our program.)

SUMMARY

The fauna scoping workshop held on April 17, 2003 provided an opportunity for SWAN Technical Committee members and scientists from other agencies to discuss and identify options for monitoring fauna as part of the networks integrated long-term monitoring program. Workshop objectives were to: 1) identify and discuss drivers of change; 2) candidate fauna for monitoring; and 3) potential attributes to monitor for candidate fauna.

As in earlier workshops, participants reviewed and discussed conceptual ecosystem models, natural resources, and resource protection issues for network parks. This provided the background for identifying the drivers of change in network ecosystems. For fauna, these drivers included both natural processes, such as weather and interannual climatic variability, and anthropogenic stresses such as extractive and non-extractive resource uses, impacts of pollutants, and physical alterations of the landscape. Understanding the importance of the influence and magnitude of different drivers of change, the consequences of the changes, and the feedbacks between species and their physical and biological environments provided the basis for identifying candidate fauna to monitor.

Functional connectivity between marine and terrestrial ecosystems was a dominate theme that emerged in this and earlier workshops. Many species or

species assemblages suggested as candidates for monitoring (river otter, black and brown bear, and Bald Eagles) are influenced ecologically by anadromous fish. SWAN parks possess intact naturally functioning terrestrial ecosystems with their historic complement of species, including large apex carnivores and predator-predator, predator-prey interactions. This feature was the basis for identifying wilderness-dependent species such as lynx, wolverine, wolf, and marten as candidates for monitoring. Other species, such as beaver and caribou, were suggested because they play ecological pivotal roles at a range of spatial scales. Sensitive and rare species, such as Kittlitz Murrelets and Harlequin Ducks, were identified because they have narrow habitat requirements and may signal ecological change from anthropogenic or other affects.

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***Guest attendees from outside the
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